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Preface

Special issue on Discrete Tomography

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The subject matter of Discrete Tomography is the following. We assume that there is a domain, which may itself be discrete (such as a set of ordered pairs of integers) or continuous (such as Euclidean space). We further assume that there is an unknown function f whose range is known to be a given discrete set (usually of real numbers). The problems of Discrete Tomography, as we perceive the field, have to do with determining f (perhaps only partially, perhaps only approximately) from weighted sums over subsets of its domain in the discrete case and from weighted integrals over subspaces of its domain in the continuous case. In many applications, these sums or integrals may be known only approximately. From this point of view, the most essential aspect of discrete tomography is that knowing the discrete range of f may allow us to determine its value at points where without this knowledge it could not be determined. Discrete Tomography is full of mathematically fascinating questions and it has many interesting applications.

During the days of October 11–13, 2000 a workshop on "Discrete Tomography: Algorithms and Applications" took place at the Certosa di Pontignano, near Siena, Italy, organized by the three editors of this Special Issue. Attendees of the workshop were invited to submit papers to the special issue based on their presentations at the workshop. All submissions were refereed by at least two experts in the field and, based on their recommendations, they were revised (in most cases at least twice) prior to acceptance. The Special Issue, consisting of these accepted papers, does not claim to provide a comprehensive coverage of the field of Discrete Tomography. Such a coverage can be found in the book "Discrete Tomography: Foundations, Algorithms and Applications" (edited by Gabor T. Herman and Attila Kuba),

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Birkhäuser Boston, Cambridge, MA, 1999. The papers in this Special Issue are samples of the research development that has taken place in the field of discrete tomography since the appearence of that book.